

ABSTRACT

An automatically passivated n-p junction is formed from a p-type body containing Group II and Group VI elements, one of which is mercury. A passivation layer is then formed having at least one window provided therein on a surface of the p-type body. The p-type body is then subjected to a reactive ion etching process using the passivation layer as a mask to form the n-p junction. Ohmic contacts are then formed on the n-type and p-type regions. The method may be extended to form an array of n-p junctions on a semiconductor body having a plurality of p-type material layers. This method comprises the further step of: etching the body to expose a portion of each layer; forming a passivation layer over the body; forming windows in the passivation layer; subjecting the body to a reactive ion etching process using the passivation layer as a mask to form an n-p junction in each layer or to form n-p junctions that extend substantially to the substrate; forming an ohmic contact to each of the n-type regions; and forming an ohmic contact to a common p-type layer or each layer of the portions. A semiconductor material comprising an n-p junction formed according to the aforementioned methods is also described, having a substrate, a layer of p-type material surmounting the substrate, a region of converted n-type material formed on a localised portion of the surface of the p-type material, so as to define an n-p junction between the p-type and the n-type material; a passivation layer surmounting the surface of the p-type material and the n-p junction, including windows respectively exposing part of the surface of the converted n-type material and a portion of the surface of the p-type material distant from the n-type

ANTOSZEWSKI, J.

Appl. No. To be assigned

US National Phase of PCT/AU03/00048

July 19, 2004

material, such that ohmic contacts may be disposed on the exposed surface, without exposing the n-p junction.